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EXAMINER
BROOKS, JULIAN D

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,136	NAKASHIMA ET AL.	
	Examiner	Art Unit	
	JULIAN D. BROOKS	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 1-20 were pending in this application [10/06/2005].

2. Claims 1, 4, and 11 were amended [10/23/2008].

3. Claim 21-23 were added [10/23/2008].

4. Claims 1, 11 and 23 were amended [04/13/2009].

5. Claims 1 and 11 have been amended [08/31/2009].

6. Claims 24 and 25 have been newly added [08/31/2009]

7. Claims 1-25 are currently pending [08/31/2009].

Drawings

8. Examiner's previous objection to the drawings, as failing to comply with 37 CFR 1.84(p)(5) because they included reference character(s) not mentioned in the description, has been withdrawn in response to Applicant's Appropriate amendment to the specification.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-4, 6, 9-14, 16, 19, 20, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabol et al., U.S. Patent Publication No. 2004/ 0101086 A1, filed on 10/27/2002, [herein Sabol], in view of Kim et al., U.S. Patent No. 6278761, published on 08/21/2001, [herein Kim], and further in view of Kvist et al., "Total and visceral adipose-tissue volumes derived from measurements with computed tomography in adult men and women: predictive equations.", published on 1988, [herein Kvist].

With respect to claim 1, Sabol discloses "A medical image diagnosing support apparatus" (See Figures 1 & 2)

"comprising: a first extraction means which extracts a body region of a subject from a tomographic image of the subject acquired by a medical tomographic apparatus" (Page 4, Paragraphs 0040, 0043, & 0044, Page 5, Paragraph 0046, lines 1-2, and see Figure 5, extraction means corresponds to Sabol's computer for tissue characterization);

"a second extraction means which extracts a non-adipose region from the body region" (Page 5, Paragraph 0046, lines 2-7, non-adipose region corresponds to Sabol's organ such as the liver), and "sets a line surrounding the non-adipose region automatically" (Page 5, Paragraph 0047, lines 5-20, sets a line corresponds to Sabol's delineating the region, furthermore, Sabol explicitly states that this is accomplished automatically),

"a third extraction means which extracts a total body adipose region from the body region" (Page 5, Paragraph 0046, lines 7-11, total body adipose region corresponds to Sabol's fatty tissue);

"a display control means which controls display of the tomographic image on an image display device" (Page 3, Paragraph 0031, and Page 5, Paragraph 0046, lines 11-23)

It is however noted that Sabol fails to explicitly disclose "a separation means which separates the total body adipose region into a visceral adipose region and a subcutaneous adipose region based on whether a specified region is located inside or outside of the line surrounding the non-adipose region"; and

"with clear indication of the visceral adipose region and the subcutaneous adipose region", as claimed.

On the other hand Kim teaches "a separation means which separates the total body adipose region into a visceral adipose region and a subcutaneous adipose region" (Col. 3, lines 15-31, visceral and subcutaneous adipose regions correspond to Kim's intra-abdominal cavity fat and subcutaneous fat respectively), and

"with clear indication of the visceral adipose region and the subcutaneous adipose region" (Col. 3, lines 18-38, clear indication corresponds to Sabol's high contrast image).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Kim into the apparatus for quantifying tissue fat content of Sabol because both Kim and Sabol are directed to

medical imaging specifically for viewing body tissue (Sabol: abstract; and Kim: Col. 2, lines 10-23), more particularly both are directed segmenting and distinguishing between the types of imaged body tissue (Sabol: Page 1, Paragraph 0008, also see Figures 5 & 6; and Kim: Abstract) and both are in the same field of endeavor. Furthermore, incorporating the teachings of Kim into Sabol would have allowed users of Sabol's multi-energy computed tomography system to not only produce an image distinguishing lean and fat tissue (Sabol: Page 1, Paragraph 0007-0008), but also particularly further segment the imaged fat tissue into subcutaneous and intra-abdominal areas as suggested by Kim (Kim: abstract). Therefore, combination of Sabol and Kim, prior art would have been obvious to one of ordinary skill in the art at the time of invention because to apply the segmentation of subcutaneous and intra-abdominal fat tissue of as taught by Kim, to improve the quantifying fat tissue content CT system as disclosed by Sabol would have yielded the predictable result of improving diagnostic ability by determining and analyzing a subcutaneous to intra-abdominal fat ratio as suggested by Kim (Kim: Page 1, lines 38-46).

It is further noted that both Sabol and Kim fail to disclose fat region discrimination "based on whether a specified region is located inside or outside of the line surrounding the non-adipose region", as claimed.

On the other hand Kvist teaches "based on whether a specified region is located inside or outside of the line surrounding the non-adipose region" (Abstract: lines 8-10, Page 1352, Col. 2, final 2 paragraphs, and Page 1353, Col. 1, and Figure 1, Kvist's area are determined based on the encircling particular regions by a light pen).

It would have been obvious to one of ordinary skill in the art to incorporate the area determination of Kvist into the modified apparatus for quantifying tissue fat content of Sabol's modified by Kim because Kvist, Kim, and Sabol are all directed to medical imaging specifically for viewing body tissue (Sabol: abstract; Kim: Col. 2, lines 10-23; and Kvist: Abstract, lines 1-2), more particularly all are then directed to segmenting and distinguishing between the types of imaged body tissue (Sabol: Page 1, Paragraph 0008, also see Figures 5 & 6; Kim: Abstract; and Kvist: Page 1352, Col. 2, final 2 paragraphs, and Figure 1) and both are in the same field of endeavor. Furthermore, incorporating Kvist into Sabol as modified by Kim would have allowed the users of Sabol to not only produce an image distinguishing lean and fat tissue (Sabol: Page 1, Paragraph 0007-0008), and further segment the imaged fat tissue into subcutaneous and intra-abdominal areas as suggested by Kim (Kim: abstract), but also particularly measure the volume of the particular areas as suggested by Kvist (Page 1353, Eqn 1). Therefore, combination of Sabol, Kim, and Kvist would have been obvious to one of ordinary skill in the art at the time of invention because to apply the encircling as taught by Kvist, to improve the quantifying fat tissue content CT system as disclosed by Sabol would have yielded the predictable result of improving diagnostic ability by determining particular areas, performing volumetric calculations, and anthropometric measurements for improved analyzation of the abdominal region.

With respect to claim 2, Sabol as modified by Kim and Kvist teaches "wherein the second extraction means extracts the non-adipose region by performing threshold

processing of a pixel value in the tomographic image" (Page 4, Paragraph 0045, threshold processing corresponds to Sabol's Hounsfield or CT number threshold techniques).

With respect to claim 3, Sabol as modified by Kim and Kvist, suggests "wherein the second extraction means sequentially searches for a pixel value range usually provided by the non-adipose region, and sets a threshold range of the threshold processing based on the most frequent pixel value in the pixel value range" (Kim: Col. 3, lines 10-14, & 38-67, and Col. 4, lines 1-17, Kim describes using histogram peaks to determine a threshold range, moreover, this range is limited to an area in which non-fat tissue will not be detected, it would be obvious to one of ordinary skill in the art to apply this described feature of Kim to set a threshold range based on pixel frequency in a range provided by the non adipose region, because it would allow for a more dynamic and accommodating detection since fat varies between people).

With respect to claim 4, Sabol as modified by Kim and Kvist teaches "wherein the second extraction means performs peripheral edge recognition processing of the non-adipose region" (Page 4 & 5 Paragraph 0045, lines 7-11), "sets a plurality of attention points on a recognized peripheral edge" (Page 5, Paragraph 0047, lines 5-19, setting a plurality of points corresponds to Sabol's delineating the region),

"wherein the separation means separates the total body adipose region into a visceral adipose region and a subcutaneous adipose region based on the outline of the

non-adipose region extracted" (Sabol: Page 5, paragraphs 0046, and 0047, Sabol delineates and extracts an organ which is not fat, furthermore see Figures 5 and 8, regions of various tissue is outlined. Furthermore see Page 4 & 5, paragraph 0045, Sabol clearly suggest using segmentation techniques such as edge detection).

It is however noted that Sabol as modified by Kim and Kvist fails to explicitly disclose "and interpolates spaces between the plurality of attention points by higher order spline interpolation to extract an outline of the non-adipose region", and, as claimed.

On the other hand Sabol states on Page 5, Paragraph 0047, lines 5-19 that a region of interest is delineated manually or automatically, moreover utilizing a higher order spline interpolation for outlining an imaged object is well known in that art as admitted applicant on Page 3, lines 28-29 of "Amendments to the specification". It would be obvious to one of ordinary skill in the art to implement a well known in the art higher order spline interpolation technique because it would provide a sufficient delineation technique while also achieving a small interpolation error.

With respect to claim 6, Sabol as modified by Kim and Kvist discloses "wherein the third extraction means extracts the total body adipose region by subtracting the non-adipose region from the body region" (Sabol: Col. 3, lines 35-38).

With respect to claim 9, Sabol as modified by Kim and Kvist teaches "further comprising an area ratio calculation means which calculates area ratios of the total body

adipose region" (Sabol: Page 5, Paragraph 0048, ratio corresponds to Kim's fat/lean ratio),

"the visceral adipose region, and the subcutaneous adipose region" (Kim: Col. 1, lines 38-46, and See Figure 8),

"wherein the display control means controls to display the area ratios calculated by the area ratio calculation means on the image display device" (Sabol: Page 5, Paragraph 0049).

With respect to claim 10, Sabol as modified by Kim and Kvist teaches "further comprising a print output means which prints and outputs the tomographic image and the area ratios controlled to be displayed on the image display device by the display control means" (Kim: Figures 2-7, tomographic images are outputted and printed as demonstrated by Kim's figures).

With respect to claim 11, Sabol discloses "A medical image diagnosing support method" (See Figures 6 and 7),

"comprising: a first extraction step of extracting a body region of a subject from a tomographic image of the subject acquired by a medical tomographic apparatus" (Page 4, Paragraphs, 0043, & 0044, Page 5, Paragraph 0046, lines 1-2, and see Figure 5, extraction step corresponds to Sabol's characterization);

"a second extraction step of extracting a non-adipose region from the body region" (Page 5, Paragraph 0046, lines 2-7, non-adipose region corresponds to Sabol's

organ such as the liver), “and setting a line surrounding the non-adipose region automatically” (Page 5, Paragraph 0047, lines 5-20, sets a line corresponds to Sabol’s delineating the region, furthermore, Sabol explicitly states the delineating is done automatically),

“a third extraction step of extracting a total body adipose region from the body region” (Page 5, Paragraph 0046, lines 7-11, total body adipose region corresponds to Sabol’s fatty tissue); and

“a display control step of controlling display of the tomographic image on an image display device” (Page 3, Paragraph 0031, and Page 5, Paragraph 0046, lines 11-23).

It is however noted that Sabol fails to explicitly disclose “a separation step of separating the total adipose region into a visceral adipose region and a subcutaneous adipose region based on whether a specified region is located inside or outside of the line surrounding the non-adipose region”; and

“with clear indication of the visceral adipose region and the subcutaneous adipose region”, as claimed.

On the other hand Kim teaches “a separation step of separating the total adipose region into a visceral adipose region and a subcutaneous adipose region” (Col. 3, lines 15-31, visceral and subcutaneous adipose regions correspond to Kim's intra-abdominal cavity fat and subcutaneous fat respectively), and

"with clear indication of the visceral adipose region and the subcutaneous adipose region" (Col. 3, lines 18-38, clear indication corresponds to Sabol's high contrast image).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Kim into the system for quantifying tissue fat content of Sabol because both Kim and Sabol are directed to medical image specifically for viewing body tissue (Sabol: abstract; and Kim: Col. 2, lines 10-23), more particularly both are directed segmenting and distinguishing between the types of imaged body tissue (Sabol: Page 1, Paragraph 0008, also see Figures 5 & 6; and Kim: Abstract) and both are in the same field of endeavor.

Furthermore, incorporate the teachings of Kim into Sabol would have allowed users of Sabol's multi-energy computed tomography method to not only produce an image distinguishing lean and fat tissue (Sabol: Page 1, Paragraph 0007-0008), but also particularly further segment the imaged fat tissue into subcutaneous and intra-abdominal areas as suggested by Kim (Kim: abstract).

Therefore, combination of Sabol and Kim, prior art would have been obvious to one of ordinary skill in the art at the time of invention because to apply the segmentation of subcutaneous and intra-abdominal fat tissue of as taught by Kim, to improve the quantifying fat tissue content CT method as disclosed by Sabol would have yielded the predictable result of improving diagnostic ability by determining and analyzing a subcutaneous to intra-abdominal fat ratio as suggested by Kim (Kim: Page 1, lines 38-46).

It is further noted that both Sabol and Kim fail to disclose fat region discrimination "based on whether a specified region is located inside or outside of the line surrounding the non-adipose region", as claimed.

On the other hand Kvist teaches "based on whether a specified region is located inside or outside of the line surrounding the non-adipose region" (Abstract: lines 8-10, Page 1352, Col. 2, final 2 paragraphs, and Page 1353, Col. 1, and Figure 1, Kvist's area are determined based on the encircling particular regions by a light pen).

It would have been obvious to one of ordinary skill in the art to incorporate the area determination of Kvist into the modified quantifying tissue fat content of Sabol's modified by Kim because Kvist, Kim, and Sabol are all directed to medical imaging specifically for viewing body tissue (Sabol: abstract; Kim: Col. 2, lines 10-23; and Kvist: Abstract, lines 1-2), more particularly all are then directed to segmenting and distinguishing between the types of imaged body tissue (Sabol: Page 1, Paragraph 0008, also see Figures 5 & 6; Kim: Abstract; and Kvist: Page 1352, Col. 2, final 2 paragraphs, and Figure 1) and both are in the same field of endeavor. Furthermore, incorporating Kvist into Sabol as modified by Kim would have allowed the users of Sabol to not only produce an image distinguishing lean and fat tissue (Sabol: Page 1, Paragraph 0007-0008), and further segment the imaged fat tissue into subcutaneous and intra-abdominal areas as suggested by Kim (Kim: abstract), but also particularly measure the volume of the particular areas as suggested by Kvist (Page 1353, Eqn 1). Therefore, combination of Sabol, Kim, and Kvist would have been obvious to one of ordinary skill in the art at the time of invention because to apply the encircling as taught

by Kvist, to improve the quantifying fat tissue content CT as disclosed by Sabol would have yielded the predictable result of improving diagnostic ability by determining particular areas, performing volumetric calculations, and anthropometric measurements for improved analyzation of the abdominal region.

With respect to claim 12, claim 12 is rejected on the same basis as the above rejected claim 2.

With respect to claim 13, claim 13 is rejected on the same basis as the above rejected claim 3.

With respect to claim 14, claim 14 is rejected on the same basis as the above rejected claim 4.

With respect to claim 16, claim 16 is rejected on the same basis as the above rejected claim 6.

With respect to claim 19, claim 19 is rejected on the same basis as the above rejected claim 9.

With respect to claim 20, claim 20 is rejected on the same basis as the above rejected claim 10.

With respect to claim 24, Sabol as modified by Kim and Kvist teaches "wherein the second extraction means sets the line surrounding the non-adipose region using peripheral edge recognition processing" (Page 5, Paragraph 0047, peripheral edge recognition processing corresponds to Sabol's algorithm for delineating using shape and size information, since delineate means to mark the outline).

With respect to claim 25, claim 25 is rejected on the same basis as the above rejected claim 24.

11. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabol et al., U.S. Patent Publication No. 2004/ 0101086 A1, filed on 10/27/2002, Kim et al., U.S. Patent No. 6278761, published on 08/21/2001, Kvist et al., "Total and visceral adipose-tissue volumes derived from measurements with computed tomography in adult men and women: predictive equations.", published on 1988, [herein Kvist], and further in view of Grauer et al., "Quantification of Body fat Distribution in the Abdomen using Computer Tomography", published in April 1984.

With respect to claim 5, Sabol as modified by Kim and Kvist teaches "wherein the third extraction means extracts the total body adipose region from the body region" (Page 5, Paragraph 0046, lines 7-11, total body adipose region corresponds to Sabol's fatty tissue).

It is however noted that Sabol as modified by Kim and Kvist fails to explicitly teach "further comprising an epidermal tissue layer removal means which removes an epidermal tissue layer in the non-adipose region", and

"from which the epidermal tissue layer is removed by the epidermal tissue layer removal means", as claimed.

On the other hand Kim states in Col. 3, lines 1-43, and Figures 3-7 that subcutaneous and intra-abdominal fat images are obtained from tomographic scans of a person's abdominal region, which obviously provides "further comprising an epidermal tissue layer removal means which removes an epidermal tissue layer in the non-adipose region", and "from which the epidermal tissue layer is removed by the epidermal tissue layer removal means", because Kim's original tomography image includes materials ranging from air to dense bone with respect to the human body, thus skin is included in this range, furthermore, Kim adjust the Hounsfield value range to distinguish fat from other imaged tissue and bodily material, therefore skin is included in Kim's distinguishing between fat and non fat regions. Furthermore see Grauer Page 632, Col. 1, lines 3-8, and Figure 1, epidermal tissue corresponds to Grauer skin among other non-fat regions distinguished between.

With respect to claim 15, claim 15 is rejected on the same basis as the above rejected claim 5.

12. Claims 7, 8, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabol et al., U.S. Patent Publication No. 2004/ 0101086 A1, filed on 10/27/2002, Kim et al., U.S. Patent No. 6278761, published on 08/21/2001, Kvist et al., "Total and visceral adipose-tissue volumes derived from measurements with computed tomography in adult men and women: predictive equations.", published on 1988, [herein Kvist], and further in view of Wollenweber, US Patent No. 7155047 B2, filed on 12/20/2002.

With respect to claim 7, Sabol as modified by Kim and Kvist teaches "body adipose measurement"

It is noted that Sabol, Kim, and Kvist fail to teach "further comprising a determination means which determines whether the tomographic image is suitable for", and

"wherein the display control means controls to display a determination result by the determination means on the image display device", as claimed.

On the other hand Wollenweber teaches "further comprising a determination means which determines whether the tomographic image is suitable for" (Col. 7, lines 5-34, & 54-62, and Figure 2, item 68, determination of suitable image corresponds to Wollenweber's thresholding to determine images with quality problems);

"wherein the display control means controls to display a determination result by the determination means on the image display device" (Col. 7, lines 47-53 determination result corresponds to Wollenweber's peaks exceeding thresholds).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Wollenweber into the modified system for quantifying tissue fat content of Sabol as modified by Kim and Kvist because all, Wollenweber, Kim, Sabol, and Kvist are directed to medical imaging (Wollenweber: Col. 1, lines 40-55, and Figures 1 & 2; Sabol: abstract; Kim: Col. 2, lines 10-23; and Kvist: Abstract, lines 1-2), more particularly both Wollenweber and Sabol are directed to computed tomography imaging systems with similar basic techniques (Sabol: Page 2 -3, Paragraph 0029; and Wollenweber: Col. 5, lines 17-39). Furthermore, incorporate the teachings of Wollenweber into Sabol as modified by Kim and Kvist would have allowed users of Sabol's multi-energy computed tomography system to not only produce an image distinguishing lean, subcutaneous, and intra-abdominal fat tissue (Sabol: Page 1, Paragraph 0007-0008; and Kim: abstract), but also assesses the loss of image quality due to lower system sensitivity as clearly suggested by Wollenweber (Wollenweber: Col. 1, lines 6-20). Therefore, it would have been obvious to one of ordinary skill in the art to use the multiple dataset collection and analyzation of Wollenweber to analyze and threshold the obtained images in Sabol's CT system to determine quality images because Wollenweber further suggest that image quality is inversely proportional to patient size (Wollenweber: Col. 1, lines 21-30), while Sabol's system is directed towards examining images of patients of larger size (Sabol: Page 1, Paragraph 0005 and 0006).

With respect to claim 8, Sabol, and modified by Kim, Kvist, and Wollenweber teach "wherein when the determination means obtains error information that the

tomographic image is not obtained from a site suitable for body adipose measurement of the subject or not acquired by a predetermined medical tomographic apparatus, the display control means controls to display the error information on the image display device" (Wollenweber: Col. 7, lines 41-53 error information corresponds to Wollenweber's peaks exceeding thresholds, and Wollenweber's white ban artifacts displayed in erroneous images).

With respect to claim 17, claim 17 is rejected on the same basis as the above rejected claim 7.

With respect to claim 18, claim 18 is rejected on the same basis as the above rejected claim 8.

13. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabol et al., U.S. Patent Publication No. 2004/ 0101086 A1, filed on 10/27/2002, Kim et al., U.S. Patent No. 6278761, published on 08/21/2001, Kvist et al., "Total and visceral adipose-tissue volumes derived from measurements with computed tomography in adult men and women: predictive equations.", published on 1988, [herein Kvist], and further in view of Rosania et al. U.S. Patent Application Publication No. 2003/0059093 A1, published on 03/27/2003, [herein Rosania].

With respect to claim 21, Sabol as modified by Kim and Kvist discloses "wherein the separation means extracts a region between a contracted circumscribed circle and a muscle region as the subcutaneous adipose region" (Kvist: Page 1353, See Figure 1),

It is however noted that Sabol as modified by Kim and Kvist fails to explicitly "when the circumscribed circle, which circumscribes the body region divided radially into predetermined numbers having the barycenter of the body region as the center, is contracted until the circle circumscribes the muscle region which is extracted by performing threshold processing to the body region" as claimed.

On the other hand Sabol as modified by Kim and Rosania suggest "when the circumscribed circle, which circumscribes the body region divided radially into predetermined numbers having the barycenter of the body region as the center, is contracted until the circle circumscribes the muscle region which is extracted by performing threshold processing to the body region" (Rosania: Page 4, Paragraph 0053-0056, and See Figure 1E and F, Rosania describes a segmentation and distribution determination technique in which circumscribing circles, radial divisions, and thresholds are used to determine the organization of a cellular object by determining the distribution of the cellular components).

It would have been obvious to one of ordinary skill in the art to incorporate the distribution and organization technique of Rosania into the tissue fat content quantification of Sabol as modified by Kim and Kvist because all are directed to segmenting and determining the content and content distribution of medical images. Furthermore, Rosania's method is especially suited for determining organization of an

image with respect to various components with in the image such as Rosania's cell nucleolus and plasma membrane which could be utilized for Sabol or Kim's muscle and fat regions etc, and therefore yield the predictable result of determining more detailed information about the temporal-spatial dynamics of Sabol's anatomical images.

With respect to claim 22, Sabol as modified by Kim and Kvist teaches "further comprising means for extracting a navel region of the subject from the tomographic image of the subject" (Kim: See Figures 2-5, naval region corresponds to Kim's image centers), "wherein the separation means extracts a region where muscle and bone region are removed" (Kim: Col. 3, lines 10-21 removed muscle and bone region correspond to Kim's narrowed Hounsfield value range), "as the subcutaneous adipose region from a portion of the body region included in a circular area of interest" (Kim: Col. 3, lines 15-38, and See Figure 3),

It is however noted that both Sabol, Kim and Kvist fails to teach "in which a radius of the circular area is half of a distance between a first attention point set at a peripheral edge of the non-adipose region and a second attention point set at middle point of each partial region of the muscle and bone region included in the regions where the navel region is removed from the extracted body region" as claimed.

On the other hand Sabol as modified by Kim, Kvist and Rosania teach "in which a radius of the circular area is half of a distance between a first attention point set at a peripheral edge of the non-adipose region and a second attention point set at middle point of each partial region of the muscle and bone region included in the regions where

the navel region is removed from the extracted body region" (See Figure 1F, Rosania's right-side middle box, Rosania's inner circular area is about half the radius of the larger circle, therefor for the region between circles, the distance is half the radius of the large circle).

It would have been obvious to one of ordinary skill in the art to incorporate the distribution and organization technique of Rosania into the tissue fat content quantification of Sabol as modified by Kim because all are directed to segmenting and determining the content and content distribution of medical images. Furthermore, Rosania's method is especially suited for determining organization of an image with respect to various components with in the image such as Rosania's cell nucleolus and plasma membrane which could be substituted for Sabol or Kim's muscle and fat regions etc, and therefore yield the predictable result of determining more detailed information about the temporal-spatial dynamics of Sabol's anatomical images.

14. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sabol et al., U.S. Patent Publication No. 2004/ 0101086 A1, filed on 10/27/2002, Kim et al., U.S. Patent No. 6278761, published on 08/21/2001, Kvist et al., "Total and visceral adipose-tissue volumes derived from measurements with computed tomography in adult men and women: predictive equations.", published on 1988, [herein Kvist], Wollenweber, US Patent No. 7155047 B2, filed on 12/20/2002, and further in view of Griffin et al. U.S. Patent Application Publication No. 2004/0207625A1, filed on 04/18/2003, [herein Griffin].

With respect to claim 23, Sabol as modified by Kim , Kvist, and Wollenweber teaches “further comprising means for extracting a navel region of the subject from the tomographic image of the subject” (Kim: See Figures 2-5, naval region corresponds to Kim’s image centers), “wherein the determination means determines that the tomographic image is suitable for body adipose measurement” (Wollenweber: Col. 7, lines 5-34, & 54-62, and Figure 2, item 68, determination of suitable image corresponds to Wollenweber's thresholding to determine images with quality problems), “when the navel region is included in the extracted non-adipose region” (Kim: See figures 3-6).

It is however noted that Sabol, Kim, Kvist, and Wollenweber fail to teach “when the air region is within a predetermined ratio”, as claimed.

On the other hand Griffin teaches “when the air region is within a predetermined ratio” (Page 17, Paragraph 0236).

It would have been obvious to one of ordinary skill in the art to incorporate the ratio of open air target an null target data of Griffin into the modified quantifying fat tissue content of Sabol as modified by Kim, Kvist, and Wollenweber, because all are directed to medical imaging and particularly Sabol, Kim, Kvist, and Griffin are all directed to establishing tissue content, moreover, both Wollenweber and Griffin are specifically directed to establishing quality metrics regarding the obtained image data. Furthermore, incorporating Griffin into Sabol as modified by Kim, Kvist, and Wollenweber would have allowed users of Sabol’s system to not only determine the quality of an obtained image but also further improve the system to account for imaging

system artifacts as suggested by Griffin (Page 17, Paragraph 0235 and 0237), an thus yield the predictable result of obtaining reduced noise image data.

Response to Arguments

15. Applicant's arguments filed on 08/31/2009, under REMARKS, have been fully considered but they are not persuasive.

- With respect to Applicant's arguments on Pages 11-12 that Sabol does not disclose or suggest "setting a line surrounding the non-adipose region automatically", Examiner disagrees, and notes, as also noted by Applicant, that Sabol's delineation can be performed automatically. Furthermore, although the exemplar area of interest illustrated in Sabol's Figure 8 includes both adipose and non-adipose tissues, this does not negate the fact that a non-adipose region (lean tissue) is surrounded by an automatically set line, since lean tissue is contained within that line. Moreover, Sabol inherently teaches that the line could also exclusively surround non-adipose tissue, (only lean tissue) because if a strictly lean area of interest were selected to be delineated there would be no adipose. Sabol's system is not limited to areas containing fat and lean tissue but simply a region of interest which to one of ordinary skill in the art can be a variety of areas. Some of which may or may not have fat, which is the focus of the observation and measurement.

Furthermore, Kvist explicitly teaches and suggests such an area which may be delineated by Sabol's delineation.

- With respect to Applicant's arguments on Pages 13-14 that Kim and Kvist do not atone for the deficiencies of Sabol, Examiner notes that Sabol teaches the limitation as claimed and therefore has not relied upon Kim for the teaching. Furthermore, Kvist reinforces the teaching of Sabol by teaching an area that may be delineated to separate adipose from non adipose tissue.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. NPL-"A Boundary optimization Algorithm for Delineating brain Objects from CT-Scans" – art is directed to a delineation algorithm for anatomical objects which analyses and determines points on a boundary.

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JULIAN D. BROOKS whose telephone number is (571)270-3951. The examiner can normally be reached on Monday to Thursday EST 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Julian D Brooks/ 11/19/2009
Examiner, Art Unit 2624

/VIKKRAM BALI/
Supervisory Patent Examiner, Art Unit 2624